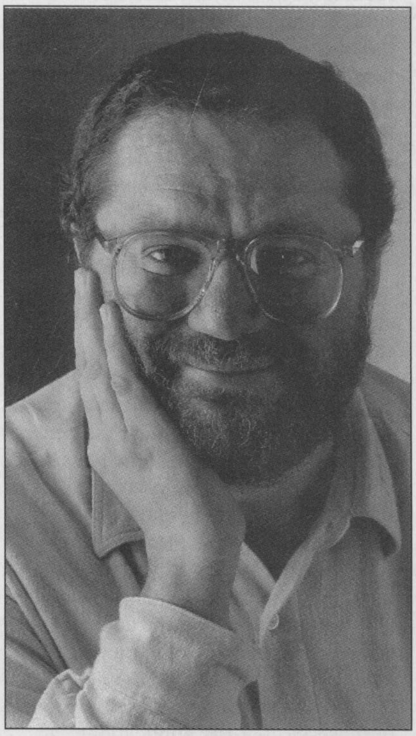
PAUL STEPHENS

Event of the month for me was the *Microsoft European Developers Conference* in Paris. Microsoft reckons to have held 20 of these conferences in the past year, and I feel as if I've been to most of them, although in fact the count is only two, plus the brief encounter with Bill Gates recorded last month. Nevertheless I am getting the hang of all this 'Information at your fingertips' business now, so the effort seems to be worthwhile.

The story so far is that Microsoft is developing a full 32-bit (80386-specific) version of *Windows* which will run on top of the mysterious 'New Technology' (NT) operating system kernel. At the same time it's promoting Object Linking and Embedding (OLE) as a way of moving towards a 'data-centric' rather than 'application-centric' way of working. It's interested in Multimedia, and has a new product called *Pen Windows* up its sleeve.

The usual image of Multimedia is of interactive video discs, 16-channel sound synthesisers and live video conferencing, but in Paris Microsoft demonstrated something much simpler – a page from a computerised encyclopaedia showing the workings of the human ear, with an animated diagram and spoken commentary to augment the text.

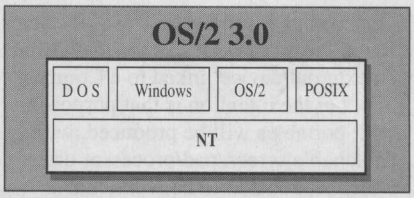
As the commentator spoke, bits of the diagram sprang to life, showing how variations in air pressure caused movement of the eardrum and bones. It was just like watching a documentary on TV, except that you could click on the commentary scroll bar and wind the presentation back, or jump instantly to a presentation on another subject. I was impressed – in so much of 'gee whiz' technology you see things which are either pointless or so imperfect as to be impractical, but I could really imagine that someone using this system would learn more than from a conventional textbook, and enjoy it more as well. Given that CD-ROM discs are already much cheaper to produce than printed books, the idea looks like a real winner.



NT OR NOT NT

That evening I wrestled with the problem of understanding NT. Microsoft shows a very confusing diagram, with NT at the bottom and MS-DOS, *Windows,* OS/2 and POSIX (a variety of UNIX and cousin to anything else ending in -IX) as peers running side by side on top of it. Now I've always viewed *Windows* as something that runs on top of MS-DOS – so if you just want to run *Windows* on your NT-controlled system, do you need MS-DOS or OS/2 as well, or will NT support it directly? And since *Windows-32,* OS/2 3.0 and NT all claim to support multitasking and multiple threads (sections of program code which work independently of each other), if you've got them all running together, as per the Microsoft diagram, which one of them is actually doing the multitasking and multithreading?

I keep asking people these questions, and none of them give me a straight answer. I even asked Bill Gates, and he declined to answer at all. In Paris I asked a Microsoft man, who gave me three different answers in the space of twenty minutes – first 'NT doesn't exist – it's just a set of APIs (Application Programming Interfaces – Microsoft's buzz-phrase of the moment)', then 'NT does exist – it's a kernel that supports other operating systems', then finally 'it exists, but not as a separate entity – it's the kernel of an operating system which supports a number of different APIs'.



● Microsoft's confusing diagram – is NT really separate, or is it just the innards of OS/2 version 3?

Now I could see how these three statements could mean roughly the same thing, but only one of them could be precisely right. The question was, which one? At one point I reached the conclusion that the Microsoft people I'd spoken to actually didn't know, although this was not very likely in the case of Bill Gates. But then a colleague in the press corps gave me his view – 'It's just OS/2 version 3.0 running DOS and *Windows* applications, only they don't want to call it that because OS/2's got a bad name and what's more is half-owned by IBM. As for POSIX, forget it – they just put that in to get US government contract approval.'

A cynical interpretation, but one that would explain the difficulty which Microsoft is having being precise. I am open to further explanation, but for the time being I've stopped wrestling.

SOMETHING TO WRITE HOME ABOUT

NT or no NT, the most impressive – nay, exciting – part of the conference was kept back until the final afternoon.

We'd all heard about *Pen Windows,* which promised handwriting recognition and 'gesture control', but none of us had seen it in action. This meant that it could in practice be anything on a scale from 'complete joke' to 'earth-shattering breakthrough' – handwriting recognition is just one step down from the *Space Odyssey* talking HAL in 'things computers will eventually do' lore, and over the years has spawned as many examples of 'working' systems incapable of serious use. In the event though, it became immediately clear that Microsoft wasn't joking at all.

Pen Windows is designed to run on machines with dual-purpose screens, which act as both display and stylus-based input device (like a graphics tablet). The computer shows you the

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display and you write on top of it, rather like a sheet of paper. Microsoft showed an external device linked to a Compaq 386, but the intention is that purpose-built portables will be produced, with detachable screen/pad/processor units which slot back into conventional keyboard/disk/ports base stations. Companies like Toshiba and NEC are, apparently, already working on them.

The first thing the demonstrator did was place the text cursor in the middle of a document and hand write a few words in some blank space on the screen. As soon as he stopped writing, the text was converted to the current typeface and inserted into the document.

Next, he highlighted a word by drawing a line through it, then made a little squiggle (a 'gesture' in *PW* terminology) on the page and the word was changed into bold typeface. By now there were a few gasps from the audience, especially those who recognised how very similar this was to the way you'd make hand-written corrections to a draft of a report or manuscript. Next, he loaded a copy of Borland's *ObjectVision* with an application which showed a life insurance policy proposal form. He wrote the proposers age in the appropriate box, and the program converted it to the right typeface, then calculated the premium rates. Then he crossed the age out (two lines) wrote in a different age, and it changed the figures.

More gasps – but the best was yet to come. He loaded *Notebook,* one of the *Pen Windows* standard applications, and began to draw a personnel diagram. He drew a rough rectangle, and it snapped into place as a perfect one. He connected rectangles with lines which became straight and reached the exact edges of the boxes. He wrote peoples names and they appeared neatly typed in the boxes – or were moved there, using the pen to indicate the position. The *piece de resistance* came however when he scribbled '2 + 2 =' on a blank area, and the machine printed it neatly on the page complete with the answer.

Once the gasping had stopped, they told us how it works. *Pen Windows* is effectively a series of add-ons for the existing *Windows* environment, and will be available to run with *Windows 3.1,* due out later this year. The main software building blocks are the pen driver modules to control the physical devices, and the 'recogniser' routines to effect the handwriting and gesture recognition. Because these hook into *Windows* at a low level, you can use them as alternatives to the keyboard and mouse drivers – hence the ability to use the pen with existing, unmodified applications, which think they're receiving input from the usual sources. Purpose-written *PW* applications can make more comprehensive use of the pen, such as the diagram-drawing and dynamic calculator we saw.

The 'recognition engine' uses pattern tables and dictionaries to recognise handwriting. Like the pen driver, it comes in the form of a Dynamic Link Library (DLL), so you can replace the standard ones with others for different input devices or even different handwriting styles and languages.

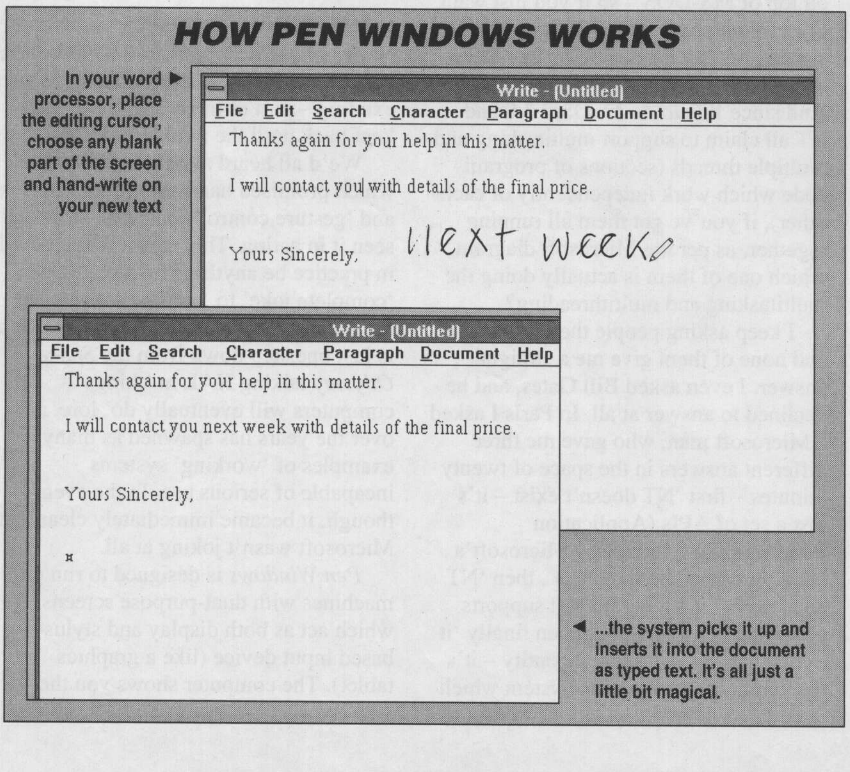
At present you have to write in 'run-on handprint', which means that the letters can overlap each other, but you should remove the pen from the surface in between each one – not write in a continuous 'cursive' flow. The recognition engine works by making repeated 'best guesses', updated each time you change the pattern – so a single vertical stroke will be considered an 'l' until you cross it, at which point it's considered to be a 't'. The dictionaries come in at a later stage, when blocks of guessed letters are compared with likely words. Such is the flexibility of the system that the programmer can adjust the delay before guessing starts, depending on whether the best results will come from processing letters individually or in the context of whole words or even phrases.

The demonstrator had clearly practised his writing, but nevertheless the level of recognition, including upper and lower case characters, was quite astonishing. Microsoft is claiming over 90 percent first time, providing you're reasonably neat – Bill Gates had warned the previous month that people would have to improve their handwriting to work with these systems, but for the sort of draft-correcting, form-filling application it's intended for, *PW's* neatness criteria seem quite reasonable.

Pen Windows impressed me in a way that few, if any, computer products have done before. Not just with its the handwriting recognition (which is excellent), or its system of gestures for editing and control (which is also excellent), but mainly with its practicality and adaptability. It can be made to run on anything from a desktop PC with a plug-in graphics tablet to a purpose-built, solid-state portable. You can use it with your existing applications, or buy new, more pen-oriented ones. As a developer, you can replace bits with your own alternative modules for special applications or hardware, without the user even having to know you've done it.

What we saw in Paris was a computer behaving like an intelligent sheet of paper – something a lot of people would really like to have. Controlled product demonstrations are dangerous places to make assessments – we watched it all on a big display screen and weren't allowed anywhere near the actual kit. Despite that, if this was at all representative of the real thing then *Pen Windows* is a genuine breakthrough in intuitive computing. In return for that, I can put up with vagueness about NT. ●

HOW PEN WINDOWS WORKS



In your word processor, place the editing cursor, choose any blank part of the screen and hand-write on your new text ▶

Write - (Untitled)
File Edit Search Character Paragraph Document Help

Thanks again for your help in this matter.

I will contact you with details of the final price.

Yours Sincerely,

next week

Write - (Untitled)
File Edit Search Character Paragraph Document Help

Thanks again for your help in this matter.

I will contact you next week with details of the final price.

Yours Sincerely,

◀ ...the system picks it up and inserts it into the document as typed text. It's all just a little bit magical.